

pieces counts as only one separated cracker. The number of total crackers is the number of sandwich crackers which were originally packed into the bags. The data is used to calculated the % separated crackers as shown below.

$$5 \quad \% \text{ Separated Crackers} = (\text{Number of Separated Crackers} * 100) / (\text{Number of Total Crackers})$$

The result is reported as an average of the five test cartons versus the average of the five Ritz Bits cartons.

EXAMPLES

The following examples are illustrative of the present invention but are not meant to be limiting thereof.

Example 1

Sandwich crackers made with a reduced fat filling are prepared as follows:

Base Cake Formulation

| Ingredient | % |
|--|-------|
| 62DE Corn Syrup (Quality Ingredients Corp., Chester, N.J.) | 2.00 |
| Olean® (Procter & Gamble Co., Cincinnati, OH.) | 12.37 |
| Hot water | 8.61 |
| enzyme tabs | 1 tab |
| L-Cysteine HCl Monohydrate (Quality Ingredients Corp., Chester N.J.) | 0.05 |
| Granulated Sugar (Holly Sugar Co., Worland, WY.) | 6.02 |
| Salt - TFC Purex (Morton International, Inc., Philadelphia, PA.) | 0.32 |
| Flour - soft wheat (Siemer Milling Co., Teutopolis, IL.) | 62.94 |
| Sodium Bicarbonate (Church & Dwight Co., Princeton, NJ.) | 1.34 |
| Calcium Phosphate Monobasic (Regent 12XX, Rhodia, Cranbury, N.J.) | 0.54 |
| Sodium Aluminum Phosphate (Levair, Rhodia, Cranbury, N.J.) | 0.54 |
| Ammonium Bicarbonate (Church & Dwight Co., Princeton, NJ.) | 2.69 |
| Cold water | 2.58 |

Base Cake Making

Dough Making

1. Corn syrup, Olean, hot water (160°F), L-cysteine and enzyme tablets dissolved in water are weighed into a mixer (APV 100# single blade horizontal mixer) and then mixed for 30 seconds @ 38 rpm.
2. Next, sugar and salt are weighed into the mixer and then mixed for 2 minutes @ 38 rpm.
3. Then the remaining dry ingredients (flour, sodium bicarbonate, and non-ammonia leavening salts) are weighed into mixer and mixed for 3 minutes at 45 rpm.
4. Then ammonium bicarbonate, dissolved in cool water, is added and mixed for one minute @ 60 rpm.
5. The resulting dough is emptied into a stainless steel tram, covered with plastic sheet, and allowed to "rest" at room temperature for 30 minutes.

Dough Forming

1. Dough is fed through a three-roll mill (Two initial corrugated roll diameters = 16.5", and one smooth roll diameter = 11.8") and sheeted to 0.25". The take-off belt speed exiting the three-roll mill is 2.0 fpm, and is matched to the speed of the dough sheet as it exits the three roll mill.
2. The sheet is sent through a calender roll #1 (a 11.8" dIA. two-roll mill), and sheeted to ~0.10". The take-off belt speed exiting the calender roll #1 is 4.4 fpm, and is matched to the speed of the dough sheet as it exits the calender roll #1.
3. As the sheet came through calender roll #1, it is folded over eight times at a width of ~10" to form a bundle of laminated dough. The bundle is covered with plastic film to prevent dehydration and briefly set aside while additional bundles are collected.
4. The laminated sheet of 3 above is sent through the two-roll mill #1 again to form 0.10" sheet.
5. The sheet continued on calender roll #2 to form a finished dough sheet of (~0.08") thickness. The take-off belt speed exiting the calender roll #2 is 7.9 fpm, and is matched to the speed of the dough sheet as it exits the calender roll #2.
6. The dough sheet is then passed under a cutter die roll to form crackers of approximately 1.1 inch by 1.1 inch square. The belt speed is 7.7 fpm. The 3.875" diameter cutter roll can be designed to cut a variety of shapes. The shape used in this example contains docking holes. The roll is obtained from Weidenmiller Co. (Itasca, IL.). The function of the docking pins is thought to join the dough layers together and create venting during baking.
7. After separating the web (the portion of the sheet left over after the shapes are cut out), the crackers are salted using a roller-salter or equivalent. The web may be recycled back to the dough awaiting introduction into the three-roll mill.
8. The cracker dough forms are then sprayed with a water mist (flow rate = 65 - 212g/mIN.) before baking. This helped attain a lighter color after baking.

Baking

1. The cracker dough forms are transferred as a continuous feed from the dough forming belt onto the oven band such that their relative spacing is undisturbed (a slight speed differential is permissible if it is desired to place the cracker dough forms closer, or further apart on the oven band prior to baking). The oven band is made of metal of the open weave versus solid surface type. Solid surface metal oven bands may also be used for certain applications.
2. The cracker dough forms are baked in an APV 45 foot long three-zone indirect-fired oven. Each zone had independent top and bottom heat applied. Dampers and temperatures in each zone are set at the following conditions:
 - 1st zone top: 465°F, bottom: 500°F, damper closed
 - 2nd zone top: 480 , bottom: 520 , damper 1/2
 - 3rd zone top: 355 , bottom: 425 , damper open

Oven band speed (fpm): 13

Final moisture contents are about 0 - 4%.

Post Baking

1. As hot baked crackers exits the oven, they are sprayed with hot oil or Olean® (~160°F) to a level of about 10% their post baked weight. The crackers are passed under heat lamps for ~15 seconds to aid in absorption of oil.
2. The crackers are then passed through a cooling tunnel at room temperature. Olean® containing products must cool through the temperature range of 130°F-140°F in about 10 minutes to ensure the proper crystalline structure.

Reduced Fat Lipid Based Filling Formulation

| Ingredient | % |
|---|------|
| Olestra (Procter and Gamble, Cincinnati, OH) | 31.8 |
| Part. hydrog. soy oil (Kaomel flakes & KLX flakes, Loders Crocklan) | 8.0 |
| American cheese powder (Kraft Food Ingredients, Memphis, TN) | 42.8 |
| Cheddar cheese powder (Kraft Food Ingredients, Memphis, TN) | 4.3 |
| Corn syrup solids (Cargill Company) | 12.9 |
| Vitamin ADK (BASF) | 0.2 |